

vegetable life only) a lower degree of life and organization may arise, like the fabled Phœnix, from ashes, and thus the simpler forms of vegetation may derive their origin from the upper; but it must be admitted there are objections to this assumption, and those not of theory and speculation, but of fact and experience. Many erumpent Fungi have not their origin in dying vegetable matter, but in substances which have long lost all vitality, and therefore can part with none to the parasites which infest them;—*Sphæria entypa*, for example, which grows within the substance of wrought wood, such as posts and rails, the origin of which cannot be explained satisfactorily according to the latter theory of the production of imperfect vegetables. The whole subject is as interesting as obscure; and it is possible that an observer who had time and leisure for tracing, with the assistance of a microscope of sufficient power, the growth of some Fungus of the lowest organization, such as *Tubercularia*, might arrive at the ultimate point of its origin, and be enabled to decide whether it had its being from a metamorphosis of the organized structure of the parent plant, or sprung from a spore, and derived its nutriment only from the material in which the germ of the parasite was previously deposited.

HENRY OXLEY STEPHENS.

Terrell Street, Bristol, March 12, 1841.

XXVI.—*An Amended List of the Species of the Genus Ovis.*
By EDWARD BLYTH, ESQ.*

THE arrival of various spoils of different species of wild sheep, since my memoir upon this genus of animals was read before the Society, enables me now to clear up several points which I formerly left as doubtful, as well as to include some additional species in the catalogue, and to indicate still more as probably distinct, and therefore desiderata to which the attention of travellers and others should be directed.

1. *Ovis Polii*, nobis (the Pamîr Sheep). In the narrative of the celebrated Venetian traveller, Marco Polo, we read (in Marsden's edition, p. 142) that upon the elevated plain of Pamîr, eastward of Bokhara, and which is 16,000 feet above the sea-level, "wild animals are met with in great numbers, particularly sheep of a large size, having horns three, four, and even six palms in length. The shepherds form ladles and vessels of them for holding their victuals.

* Read before the Zoological Society, July 28, 1840. The notes, bringing the subject up to the present state of information, are now added by the author for publication in this work.

They also construct fences for enclosing their cattle, and securing them against the wolves, with which they say the country is infested, and which likewise destroy many of the wild sheep or goats (*moutoni v. becchi* or 'boucs').” More recently, an animal called the *Rasse* was indicated, from report, in Sir Alexander Burnes's 'Travels in Bokhara,' ii. 208, and its horns have since been transmitted to the Royal Asiatic Society by Lieut. Wood, of Sir A. Burnes's party, through the medium of G. T. Vigne, Esq.* In this magnificent specimen of a frontlet I recognize (though with some hesitation) the *Ovis sculptorum*, formerly described by me from a horn in the Museum of the Royal College of Surgeons; but as the characters of that specimen, as originally drawn up by me, have not hitherto been published; as its flexure, too, which suggested the appellation of *sculptorum*, would appear to form a less extended spiral than is

* This pair of horns was labelled "*Rass*, or *Roosh*;" and Sir A. Burnes writes—"I heard of an animal called *Rasse* by the Kirghizes, and *Kooshgar* by the inhabitants of the low countries;" but Lieutenant Wood (in the narrative of his 'Journey to the Source of the Oxus,' p. 368) distinguishes between the "*Rass*" and "*Kutch-gar*;" the former "having straight spiral horns, and its dun colour being of a reddish tinge." Mr. Vigne is of opinion that this animal is no other than the *Markbur* (p. 155), which he tells me is found upon the hills of Budukshan, and which I consider to be a feral race of domestic Goats of remarkably large size, but otherwise not essentially differing from the Shawl Goat of the same countries. Of a specimen of the "*Kutch-gar*, or Wild Sheep," Lieut. Wood remarks—"It was a noble animal, standing as high as a two-year old colt [Kirghiz Pony?], with a venerable beard and two splendid curling horns, which, with the head, were so heavy as to require a considerable exertion to lift them. Though in poor condition, the carcass, divested of its offal, was a load for a baggage-pony. Its flesh was tough and ill-tasted; but we were told that in autumn, when the animal is in prime condition, no venison is better flavoured. The *Kutch-gar* is gregarious, associating in herds of several hundreds. They are of a dun colour, the skin more resembling the hide of a cow than the fleece of a [tame] sheep. A skeleton of this animal, and several complete crania, were deposited, I believe, at Indiana." This traveller confirms the statement of Marco Polo, mentioning that—"We saw numbers of horns strewed about in every direction, the spoils of the Kirghiz hunter. Some of these were of an astonishingly large size * * *. The ends of these horns, projecting above the snow, often indicated the direction of the road; and whenever they were heaped up in large quantities, there our escort recognized the site of a Kirghiz summer encampment." This was at 14,400 feet above sea-level. It is curious that the Kirghizes shoe their horses with, and make stirrups from, the horns of this animal. "The shoes are nothing more than a semicircular piece of horn placed on the fore part of the hoof. When the horse is in constant work, it requires renewal at least once a week." Burnes "was told that the *Rasse* is larger than a cow and less than a horse; of a white colour, with pendent hair under the chin * * *. The flesh is much prized by the Kirghizes, who hunt and shoot the animal with arrows. It is said to delight in the coldest climates, and a common-sized specimen will require two horses [Kirghiz Ponies] to bear its flesh from the field." The appellation *Rasse*, it may be remarked, is likewise bestowed on a small species of Civet, the *Viverra Rasse*, Horsfield, or *V. Indica*, Is. Geoff., but not of British authors.—E. B.

probably normal, and the habitat also proves to be different from that anticipated,—namely, the Taurus, which I have still reason to suspect contains a large undescribed species of this genus;—I here propose to dedicate the present splendid animal to the illustrious Venetian traveller of the thirteenth century, by the name of *Ovis Polii*.

As compared with the Rocky Mountain Sheep of North America, the *Rass* or *Roosh* of Pamir differs in having the horns considerably less massive, but more prolonged, approaching more in character to those of the domestic *O. Aries*, but differing again from the latter, not only in their very superior size, but in having their two front angles about equally developed. As in the Rocky Mountain species, and I believe also the *O. Aries* normally, the pair at first diverge backward, and then descend and gyre round at a parallel with the axis of the body, inclining, as they again spire backwards, more outward to the tip. The horns described were in their seventh year of growth, and measure 4 feet 8 inches in length, following the curvature, and $14\frac{1}{4}$ inches round at base, having the tips, which are continued round till they point obliquely backwards, 45 inches apart. The width of their upper plane is $3\frac{1}{2}$ inches at base, $2\frac{3}{4}$ inches at the distance of one foot from the base, and $2\frac{1}{2}$ inches at 2 feet distance from the base; the depth of the base inside is 5 inches, and distance apart of the pair, measured outside, where they gyre forward at a parallel, 21 inches. The years of growth are successively $15\frac{1}{2}$, $10\frac{1}{2}$, 13, 8, 5, 3, and the last (incomplete) 1, inches. The College of Surgeons' specimen, a single horn, was in its eighth year of growth, but measures only 4 feet 4 inches round the curvature; its depth towards the base is 6 inches, and greatest width, about the middle, $2\frac{3}{4}$ inches. The successive annual growths are $12\frac{1}{2}$, 9, 8, 8, 7, 5, $3\frac{1}{2}$, and the incipient eighth 1, inches. It is curved in a spiral involution, and scarcely outwards for three-fifths of a circle, when it gradually inclines more so to the tip, the horn describing one circle and about a third. When upon the head, it must accordingly have gyred considerably inward, instead of descending at a parallel with the other, as indeed is almost invariably the case with the domestic *O. Aries*. Both specimens are of a pale colour, and indented with rugged transverse striæ, in general half an inch apart. Of the animal nothing further is yet known. Considering, indeed, the differences of the two specimens, it is by no means improbable that they will yet prove to be of allied rather than of the same species, in which case my former name of *O. sculptorum* might be retained for that to which it was applied.

2, 3, and 4. The museums of Western Europe do not, that I can learn, contain any portion of the Siberian Argali, *Ovis Ammon* of Pallas, that might serve for comparison with the Rocky Mountain Sheep of North America, *O. montana* of Desmarest; but as the Kamtschatka Argali is described as a distinct species, *O. nivicola*, by M. Eschscholtz in his 'Zoologischer Atlas,' (differing from the two preceding in its inferior size, and in wanting, it would appear, the pale disc surrounding the tail, so conspicuous in both the others,) the probability is thus enhanced, that the Siberian and Rocky Mountain

species are not the same, however closely they may resemble. The descriptions of *O. Ammon* would seem to apply in every particular to the *O. montana*, though it is still probable that actual comparison of specimens would lead to the detection of some discrepancies, as generally, but not always, happens in like cases. I may notice, that while Mr. Drummond affirms that the horns of old rams of *O. montana* "attain a size so enormous, and curve so much forwards and downwards, that they effectually prevent the animal from feeding on level ground*," the same had previously been remarked by Strahlenberg of the Argalis of Siberia†, and no doubt is equally observable in the *Rass* of Pamir. The finest specimen of a head of the Rocky Mountain animal, of seven heads of adult males examined, is in the collection of this Society, and gives the following measurements: horns 3 feet 5 inches over the front ridge, and $17\frac{1}{4}$ inches round at base, where the front angles are $4\frac{3}{4}$ inches apart. They number nine years of growth, which successively give 9, $7\frac{1}{2}$, $6\frac{1}{2}$, 5, $4\frac{1}{2}$, 4, $2\frac{1}{4}$, $1\frac{1}{4}$, and 1, inches. They are nearly equilaterally triangular, but bulge a little between the angles, having the inner or front angle obtusely prominent, the posterior double, or forming a second plane at a slight angle with the superior one, and the inferior angle (if such it can be called) much rounded off: the greatest depth of the horn is about 6 inches; from base of front angle to tip they measure 11 inches; and the tips apart 26 inches. They are everywhere strongly furrowed across, more particularly in front, the intervals between the grooves swelling out considerably; and they gradually become, as in all the rest of the genus, more compressed to the extremity.

Of the *O. nivicola* of M. Eschscholtz, that naturalist writes: "The specimen described is a male in winter garb, measuring 5 feet (French?) in total length, and 2 feet 5 inches high. Its outer coat is of a yellowish grey colour, brighter on the under parts, and inclining to straw-yellow on the head and neck; the markings in front of the limbs are of a rust-colour: horns equilaterally triangular, 3 inches thick at base, and gyring outwards to form one complete spiral circle, 10 inches in diameter, and having their points directed outwards and forwards; the upper and posterior portions of the horn are level, and marked with deep annual indentations, which successively measure 7, 6, 5, 4, 3, 2, 2, and $1\frac{1}{2}$, inches, making eight years of total growth; besides which, there are numerous minor indentations or ordinary cross-striæ, but no protuberant intervals." From the figure they would seem not to bulge between the angles, as is usual, though not invariably the case, with the Rocky Mountain species; as also to be somewhat more tensely spiral, as if pulled a little outward. The appearance both described and figured at the base of the fore-limbs externally, I suspect to be nothing more than the *axilla*, that had been twisted outwards in the mounting of the specimen. M. Eschscholtz describes this animal to be very nume-

* *Fauna Americana-borealis*.

† Description of the northern parts of Europe and Asia.—Eng. Transl., p. 332.

rous on the mountains of Kamtschatka, residing upon the snow-clad heights in summer, and descending to the lower regions in winter. A notice of its chamois-like agility occurs in the narrative of Kotzebue's Voyage from 1823 to 1826.

In the 18th volume of the 'Asiatic Researches,' part ii., Mr. Hodgson, of Nepâl, gives a figure of a horned female of the Nahoor Sheep, and also of the skull and horns of a young ram, which he erroneously refers to that species, as since described by him. He also mentions having once possessed a pair of the horns, which he "could only lift from the ground with a considerable effort;" but it is necessary to observe, that the description which he gives in the volume adverted to, of the mutilated skin of a young wild ram, procured in mid winter, refers evidently to the Nahoor, and not to the species with horns having a triangular section, which is the subject of the present notice. According to Mr. Hodgson, the horns of this young specimen are "equilaterally triangular," as the figure likewise represents; whereas the Rocky Mountain species would at the same age have much compressed horns, far from attaining to an equilateral triangle. Should a true species be here indicated, as is not improbable, distinct from *O. Ammon*, I propose that it be dedicated to that assiduous investigator of Nepalese zoology, and be accordingly termed *O. Hodgsonii*.

5. *O. Californiana*, Douglas. The Jesuit missionary Venegos observed in California "a kind of wild sheep, the size of a calf of one or two years old, with extraordinarily thick horns, resembling those of a common ram, and tail shorter than that of a stag," whence it would appear that the Rocky Mountain species, or a near ally, is here alluded to. Mr. Douglas describes the Californian Argali to have a tail 18 inches long (*vide Zoological Journal*, iv. 332). Its length, he observes, from nose to base of tail, is 5 feet 10 inches; height of the shoulder 2 feet 8 inches; girth behind the shoulders 6 feet; head 16 inches long, 7 [to] between the eyes, and 9 [to] between the horns: ears erect, $1\frac{1}{2}$ inch [$4\frac{1}{2}$ inches?] long, obtuse. The horns deposited in the museum of this Society bear a general resemblance to those of the Rocky Mountain species, but are smoother, and form a much more open spiral: the terminal third is very much compressed; the medial intermediate, and the basal very thick and triangular: they were only in their fifth year of growth, and would doubtless have attained to much greater dimensions. Their length is 32 inches, measured over the front ridge, and girth at base $14\frac{1}{2}$ inches, having a span of $12\frac{1}{2}$ inches from base to tip inside: from the tip to first annual depression they measure $12\frac{1}{2}$ inches, and then successively $6\frac{1}{4}$, $5\frac{1}{2}$, $4\frac{3}{4}$, and the incipient fifth year's growth 2 inches. They do not bulge between the angles, which are rather obtuse, and, as usual, are transversely striated. Approximate distance of the tips apart 33 inches.

"From the testimony of the Indian tribes about the Great Falls of the Columbia River," writes Mr. Douglas, "this species appears to inhabit the subalpine regions of Mounts Wood, St. Helen's, and Vancouver, but is more numerous in the mountainous districts of the interior of California. The only good skin that ever came under

my observation was in lat. $46^{\circ} 14' 55''$, and long. $121^{\circ} 17' 0''$." Forbes, in his recent work on California, appears to allude to it by the name of *Berindo*, which in Mexico is applied to the *Antilocapra furcifera*. He quotes, however, the description by Venegos, including the statement that it has a short tail, and remarks, that "they still abound in the plains at the foot of the mountains, and are always found in large herds." It does not, from the context, appear to me that the prong-horned animal is intended.

From these we might proceed, through the domestic *Aries*, to the species generally typified by the Moufflon of Corsica; but I shall interpolate a small group from the Himalaya, and apparently Caucasus, distinguished by having smooth and sub-cylindrical horns, that form a bold arc outwards at nearly right angles with the axis of the body, and have the tip turned backward. Such is

6. *O. Nahoor*, Hodgson; the *Nahoor* or *Nervati*, and *Snà* (not *Shà*) of Thibet. Size of the larger breeds of tame sheep, with pale horns, and general colour dull brownish grey in old animals, with the ordinary dark markings on the face, breast, and limbs, more or less developed. Younger specimens, more particularly, have their coat, when renovated, tipped with a light fulvous tint, deeper along the middle of the back; the tail is bushy, and conspicuously white, its medial portion generally dark. Length, as given by Mr. Hodgson, 4 feet from nose to base of tail, and height of the back 32 inches. A female was 3 feet 4 inches from nose to tail, and stood 29 inches high at the shoulder. From nose to between the horns a male measured $8\frac{1}{2}$ inches; the ears $4\frac{1}{2}$ inches; and tail 4 inches, or 7 inches to the end of the hair. A pair of horns in the museum of this Society, which are far from having attained their full growth, measure 12 inches in circumference at base, and $20\frac{1}{2}$ inches long over the curvature, having their tips 27 inches asunder: their successive annual growths were respectively $6\frac{1}{2}$, 4, 3, $2\frac{3}{4}$, $2\frac{1}{2}$, and $1\frac{3}{4}$ inches. Mr. Hodgson mentions a pair that were each 32 inches long. Those of a very old female in the British Museum have precisely the same curvature as in the male, only that the tips do not turn so much backwards; they are, however, much compressed, and measure $9\frac{3}{4}$ inches long, $4\frac{1}{2}$ inches round, with the tips 14 inches apart. Another female, in the collection of this Society, is entirely destitute of horns. The latter, and a young male which I formerly examined at Mr. Leadbeater's, accorded perfectly with the description of Mr. Hodgson, having pale slaty-blue hairs, deeper on the back, and tipped with a rufous tint, more particularly on the back, which caused the animal to appear of a pale fulvous or isabelline hue. An old male in the museum of the Linnæan Society*, and the aged female in the British Museum, together with another skin which I have seen, have not only no trace of this colour in their present state of *pelage*, but I doubt whether they showed much of it when their coat was new: the colour of all three is a dingy grey-brown, not easy to express in words.

* Mistaken for *Ovis Ammon* in the 'Fauna Americana-borealis,' vol. i. p. 274, and for a second specimen of *O. Burrhel* in Part 6, p. 79, for July 10th, 1838, of these 'Proceedings.'

The horns of the Nahoor differ but little in flexure from those of the next species, but may nevertheless be distinguished by many differences, in general strongly pronounced: as their superior size; the greater proportional thickness of the basal half, beyond which they narrow somewhat abruptly; the flatness of their dorsal aspect, with a much more acutely raised ridge along its middle; and by the comparative sharpness of all the angles, together with the existence, generally, of some traces of cross striæ, more particularly towards their compressed tips; whereas the horns of the Burrhel Sheep are much less angular, of a deep rufous-brown colour, and quite smooth. Those of the female Nahoor described were entirely destitute of cross furrows, but all have the marks of annual growth conspicuously indented.

This species, according to Mr. Hodgson, "inhabits the Kâchar region of Nepâl, northward of the habitat of the Jharal Goat, amid the glaciers of the Himalaya, and both on the Indian and Thibetan sides of that range." Mr. Vigne informs me that it is plentiful in Great, but not in Little Thibet. I suspect that it is never found at so considerable an altitude as the next species.

[To be continued.]

XXVII.—*Flora of Central Norfolk.* By S. P. WOODWARD, Esq.

Addenda to Mr. Mann's List of Norwich Plants.

UPON comparing the list of Norwich Plants given by Mr. R. J. Mann, in the August number of the 'Magazine of Natural History' (vol. iv. p. 390), with my own, I found many interesting plants and localities had been omitted; and as it is not to be expected that one observer should, in a few years' investigation, discover all his district contains, I cannot but regret that Mr. M. did not avail himself more extensively of the information of other collectors. For the omitted localities there is no remedy, and for the plants time only allows me to give what are recorded on my lists in addition to those just published. Mr. Wigham, of Norwich, could, I believe, supply many others which his long residence has made him familiar with. In the Mosses and Hepaticæ much remains to be done ere our list will vie with that of Yarmouth, published by Mr. Paget; the freshwater Algæ of this district have been entirely neglected; and the Lichens, no one, that I am aware of, could catalogue. Mr. Paget's list, which gives the result of the labours of Mr. Dawson Turner and other indefatigable botanists, must represent all that is known at present of the distribution in Norfolk of these extensive and intricate classes. Mr. Stock of Bungay, who has for some years collected the minute parasitic Fungi with great perseverance and success, will, it is to be hoped, some day publish a detailed list; in the other